Development of the ‘healthcor’ system as a cardiac disorders symptoms detector using an expert system based on arduino uno

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Abstrak

In the modern era, our lifestyles are very fast-moving; this makes us highly susceptible to diseases, especially those associated with heart problems. In this research, we developed a portable early detection system for cardiac disorders. This system consists of passive electrodes, named SHIELD-EKG-EMG-PA; a shield which allows Arduino-like boards to capture electrocardiography (ECG) and electromyography (EMG) signals, named SHIELD-EKG-EMG, both devices produced by Olimex; a microcontroller, based on Arduino Uno; and an expert system which is implemented by a personal computer. This system detects time intervals of various segments in ECG signals which are captured by the devices; it then analyzes the signals in order to determine whether the patient has cardiac disorders. We call our detecting system the HEALTHCOR system. A database was established, containing various possible values of parameters in ECG signals. The types of diseases that can be detected are heart rhythm disorders including sinus bradycardia, sinus tachycardia, sinus arrhythmia, and cardiac symptoms associated with intervals and the wave height, such as myocardial infarction. From our tests, the accuracy of our system is 96%. The resultant diagnoses of four patients are all appropriate, and used a commercial 12-lead electrocardiograph.